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A NEW SUCTORIAN FROM WOODS HOLE

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The aberrant group of the Infusoria known as the Suctoria have been but little studied in the United States. In Europe, however, the monographic work of Sand and, more recently, of Collin have made them well known.

In 1914 I published some notes on the reproduction and food reactions of a fresh-water species of the genus Podophrya which appeared in hay-infusions at Baltimore. Through this work I became interested in this peculiar group of the protozoa and during the summers of 1916 and 1917, while at Woods Hole, Mass., I collected and studied five species of Suctoria which attached themselves to the stalks of the common hydroids, Obelia commissuralis and Obelia geniculata.

The four previously described species found were as follows:

Ephelota coronata (Wright).
Acineta tuberosa Ehrenberg.
Paracineta livadiana (Mereschowsky)—This is probably the species referred to by Calkins (1901) as "Acineta divisa Fraipont."
Ophryodendron abe itinum Claparede et Lachmann.

Besides these four species another was present which was obviously new and extremely remarkable, showing decided resemblances to Acinetopsis rara Robin.

The genus Acinetopsis was established by Robin (1879) to contain a single species, Acinetopsis rara, characterized by the presence of a stalked theca with free apical margin (a "coque" in the terminology of Collin [1912 page 117] and by the presence of a single extensile, flexible tentacle in the center of the apical surface of the body. This species has never been reported by any other observer. Martin (1909) attempted to identify Robin's Acinetopsis rara with one stage in the life history of his new species, Tachyblaston ephelotensis. This identification has not been accepted by Collin in his monograph of the Suctoria, and will hardly be agreed to by anyone who will take the trouble to compare Martin's figures with the original figure of Robin, as reprinted in the Journal of the Royal Microscopical Society (1880). More recently Collin (1909, 1912) has described a new species under the name of Acinetopsis campanuliformis. This species is described as having a bell-shaped "loge" or closed theca, and bears six flexible tentacles. Collin seems to have overlooked the statement of Robin that Acinetopsis rara has a theca with free margin, and has classified Acinetopsis as a genus with closed theca. If this difference be really of generic importance, Collin's Acinetopsis campanuliformis must be placed in a new genus.

The species which I found at Woods Hole so closely resembles Acinetopsis rara at one stage of its life-history that I am not willing to erect a new genus for it, in spite of the fact that in this new species I find that the flexible extensile organ proves to be a seizing organ, analogous to the pointed tentacles of Ephelota and without any suctorial function. To this new species I have given the name of "tentaculata," because in its adult condition it is provided with true sucking tentacles as well as with the elongated "probosces" which I consider characteristic of the genus.

DESCRIPTION OF ACINETOPSIS TENTACULATA N. SP.

Protoplasmic body enclosed in a flattened, cup-shaped theca with a free apical margin, borne on a slender stalk a little longer than the theca itself. (See Figure 1). Body irregularly flattened-ovoid in shape, bearing on the apical face one or two probosces. Each proboscis is a very mobile organ, which can be bent in any direction, extended until it is a mere thread twice the length of all the rest of the organism, or retracted until it is less than half the length of the protoplasmic body alone. Structurally, the proboscis consists of a homogeneous central strand about whose outer surface is wound spirally a ribbon of protoplasm evidently contractile in nature. Each proboscis is tipped with a large, highly refractive globule of adhesive and viscous character. That the probosces are firmly anchored to the body is self-evident from the observations given later regarding their use in feeding. As is shown in Figure 2, this attachment is well below the surface of the body, but I have not been able to make out the details. Besides these probosces the apical face of the body also bears about twenty or thirty short stout tentacles of the familiar capitate type, these being distributed in two groups, one on either side of the insertion of the probosces.

The macronucleus has irregular outlines, but is in general roughly ovoid. One or more small spherical micronuclei are present. A single contractile vacuole is located near the base of the body.

The measurements of a typical mature specimen were as follows:
Protoplasmic body—138 microns long, 100 microns wide, 73 microns thick.
Theca—187 microns long, 105 microns wide.
Stalk—287 microns long.
Proboscis when fully extended—about 500 microns long.

Feeding Habits

As far as I have been able to observe, Acinetopsis tentaculata feeds only on Ephelota coronata, but it attacks this common species with voracity. The probosces are extended and moved about until the globule at the tip of one of them comes in contact with the body of an Ephelota. It seems to secure a firm attachment at once and in a few cases where the Ephelota was very firmly attached to its stalk I have seen the globule elongate and finally pull in two rather than release its victim. As soon as the attachment is secured the proboscis contracts strongly, drawing the body of the Ephelota within reach of the short sucking tentacles of its captor. Sometimes the stem of the Ephelota is long enough so that this can be accomplished by merely bending it. More often the attachment between the body of the Ephelota and its stem must be broken by a rapidly repeated series of jerks due to sudden contractions of the proboscis. When the Ephelota finally comes within reach it is firmly seized by the sucking tentacles and its internal protoplasm sucked out at leisure. One of the difficulties in the study of this species was the long search which was always necessary to find an individual whose body was not almost entirely concealed by several Ephelotas in process of being sucked dry.

Reproduction

The actual escape of the embryo was not observed, but Figure 3 shows plainly that reproduction occurs by the same process of simple (i. e. not multiple) internal budding which is characteristic of all the genera of the family Acinetidae. Nor have I observed the entire series of stages in the attachment and growth of the free-swimming ciliated embryo. From the young individuals I have found in nature, it seems probable that after attachment and the formation of a stalk and theca, a single proboscis is first formed (Figure 4). This condition is structurally a perfect duplicate of Robin's Acinetopsis rara. Slightly larger individuals still show only a single proboscis but have also formed a number of true tentacles (Figure 5). And finally, in mature individuals, we find the two probosces characteristic of the species.

There is a great temptation here to suggest that these growth stages may reflect something of the course of evolution in this genus. It seems quite probable, for example, that the second proboscis, the last organ acquired by the individual, is a recent evolutionary acquisition of the species. It would probably be going too far to intimate that the stage with a single proboscis and no tentacles harks back to some ancestor in which the proboscis was a true sucking tentacle and no other organs for capturing prey were necessary. However, this must be the condition which obtained in Robin's Acinetopsis rara, unless he overlooked the inconspicuous tentacles or was dealing only with a growth stage.

SUMMARY

Acinetopsis tentaculata n. sp. is described and figured. It is characterized by having a stalked "coque" or theca with free apical margin, and by the presence of one or two extensile seizing organs or probosces as well as suctorial tentacles. It feeds on Ephelota, seizing them and drawing them within reach of its tentacles by means of the probosces. It reproduces by internal budding, forming free-swimming ciliated embryos which settle down and gradually grow into the adult form.

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DESCRIPTION OF PLATE

All figures are camera drawings from specimens killed in Dubosque's alcoholic modification of Bouin's Fluid and stained with picric acid haematoxylin.

Figure 1. Acinetopsis tentaculata. Side view of entire mature specimen with one proboscis partly extended and the other nearly retracted. x 185.

Figure 2. Acinetopsis tentaculata. Front view of body and theca of mature specimen. Note deep attachment of probosces and arrangement of tentacles in two groups. x 350.

Figure 3. Acinetopsis tentaculata. Front view of an individual in which the macronucleus is just dividing to form the macronucleus of an internal bud. x 350.

Figure 4. Acinetopsis tentaculata. Young form with a single proboscis and no tentacles. x 350.

Figure 5. Acinetopsis tentaculata. Young form with a single proboscis and a few tentacles. x 350.

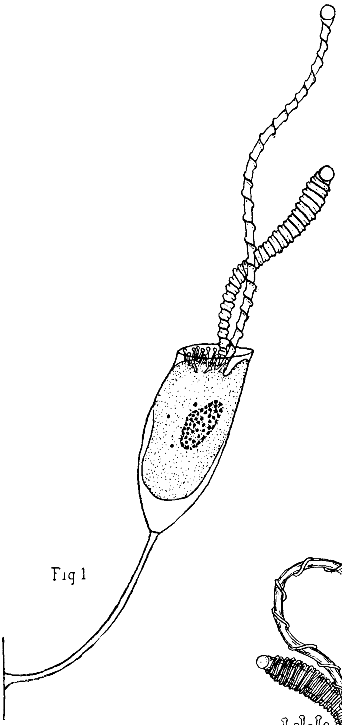

Fig 1

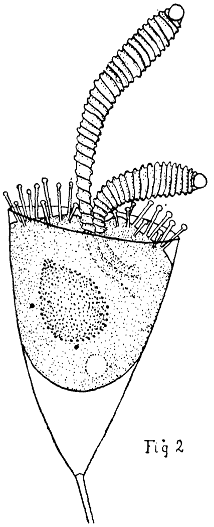

Fig 2

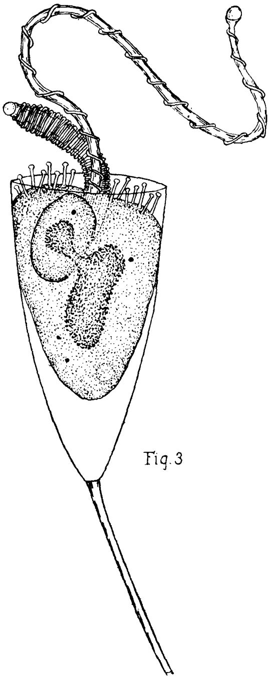

Fig. 3

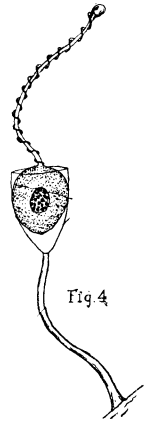

Fig. 4

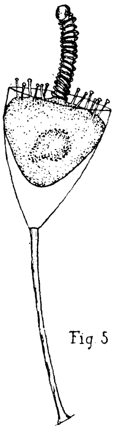

Fig 5